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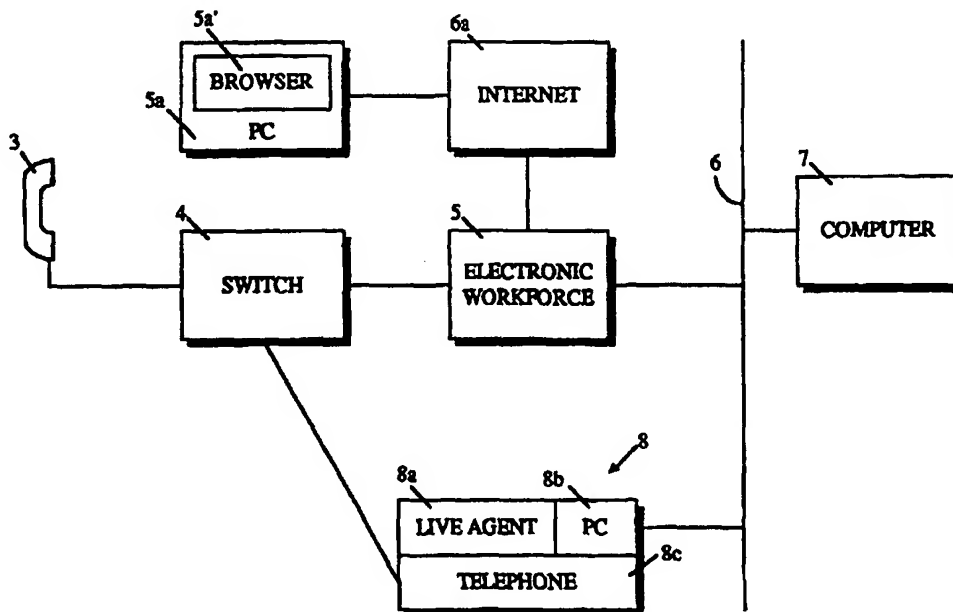
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(54) Title: WEB PAGE SYNCHRONIZATION SYSTEM AND METHOD



(57) Abstract

A system and method are provided for routing data base information obtained in an automated Internet message response to a subsequently selected live agent. An electronic workforce identifies the customer, pulls customer identification, pulls a record on the customer, provides information requested by customer, and permits the customer to select a live agent, provides the live agent number to determine the network identification number. Accordingly, the live agent receives data base information on a customer at the time the live agent begins conversation with the customer.

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WEB PAGE SYNCHRONIZATION SYSTEM AND METHOD

Technical Field of the Invention

This application is a continuation-in-part application of U.S. Patent Application Serial
5 No. 08/419,103, filed April 10, 1995 and having the title "Object Oriented Customer
Information Exchange System and Method" which is hereby expressly referenced and
incorporated herein by reference.

This application is further related to U.S. Patent Application Serial No. 08/____, filed
on even day herewith and having the title "Computer Telephony Integration System and
10 Method" which is hereby expressly referenced and incorporated herein by reference.

Technical Field of the Invention

This invention relates to systems and methods for computer telephony and web page
synchronization.

Background

15 Current Internet systems interact problematically with private branch exchange (PBX)
switches connected to voice response units and electronic workforces, operating with computer
data bases. The on-line customer may wish to modify data stored in a computer data base but
needs subsequently to communicate directly with a live agent accessible through an automatic
call distribution (ACD) queue.

20 The customer information which has been produced from database storage based upon
the customer identification must typically either be reproduced again from the original data base
or must be transmitted to the live agent to enable the provide immediate assistance without
having to repeat the entire user identification and data query operation which produced user
specific information to service the particular call.

25 Unfortunately, currently available methods and systems for routing user information
based upon an initial automated user identification to a subsequently determined live agent are
slow, cumbersome, and require repetitive presentation of the same customer information first to
the voice response unit and electronic workforce, and then directly to the live agent, followed by
waiting periods during which the live agent accesses a computer data base indicating customer
30 data by customer ID#.

SUMMARY OF THE INVENTION

According to the present invention, a customer inquires by Internet and through an automated voice response unit (VRU) or electronic workforce as to information in a computer database on a computer which is network connected to the automated VRU or electronic workforce. The electronic workforce system or VRU makes a customer identification request over the Internet. The customer then provides its ID# or other identification code to permit extraction of customer specific information from the database. The electronic workforce system according to the present invention uses the identifying information to query a computer database for information about the inquiring customer. The information provided in the database may include information about customer characteristics or preferences. This or other information is then provided by the electronic workforce system to the customer via the Internet. In view of the information received, the customer may wish to speak with a live agent. If the customer elects a live agent, a particular live agent is selected through an automatic call distribution (ACD) queue process.

According to the present invention, Internet messages on a web server are processed along with switch and computer based information using a voice response unit (electronic workforce) such as an electronic workforce, a switch such as a private branch exchange (PBX), a computer having a data base, and a live agent having direct access to a personal computer and a telephone.

According to the present invention, a software agent in the electronic workforce performs intelligent call routing with information about a customer provided to a live agent identified after the call has been received by the electronic workforce and after the customer has made a request for a live agent.

According to the present invention, a software agent transfers a call to a live agent and accesses a customer's record so the live agent can answer the call in a more personal and efficient manner. Thus, a coordinated call and screen transfer operation, i.e., screen popping evolution, is accomplished with the customer identify being established once by the electronic workforce without need for reascertainment by the live agent, because the information about customer identity is passed by network to the correct one of a number of live agents working a switch site.

According to the present invention, telephone calls are intelligently routed and transferred by a call center agent performing account handling activities, based upon ANI/DNIS information. The software agent receiving the call obtains calling party information, permitting access to a local table, local or remote database information, or a host computer about the

customer or number dialed to route the call to a specific live agent, live agent group, or particular electronic work force (EWF) job description.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1a is a block diagram of a combined Internet and computer telephone system
5 according to the present invention;

Figure 1b is a block diagram of a live agent personal computer (PC) including mainframe access software and associated desktop control and browser software;

Figure 1c is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing a browser installed on
10 a customer's personal computer, the Internet, an electronic workforce, a computer, and a browser installed on the personal computer of a live agent;

Figure 1d is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing a browser installed on a customer's personal computer, the Internet, an electronic workforce, a network bus, and a
15 computer;

Figure 1e is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing electronic workforce and browser which is installed on the personal computer of a live agent;

Figure 1f provides an updating process for an agent browser (LAB), according to the
20 present invention;

Figure 1g is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing electronic workforce
5, personal computer 8b, desktop control software 8b", and browser 8c which is installed on the personal computer of a live agent, according to one embodiment of the present invention;

Figure 1h shows an updating method according to the present invention, wherein desktop control software 8b" is used to simulate a user request for information from electronic workforce
25 5;

Figures 2a-2b are a composite display window for an electronic workforce indicating a screen programming process according to which an automated call processing sequence is
30 defined to respond automatically to a customer Internet inquiry and to identify a live agent, according to the present invention; and

Figures 3a-3e shows a method of call processing according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1a is a block diagram of an Internet computer telephony system according to the present invention. The system of the present invention includes a first telephone 3 used by a customer interested in speaking with a live agent about information in a data base, after initial on-line communication with the data base has proven unsatisfactory. The system further includes a switch 4 such as a private branch exchange (i.e., a PBX), a voice response unit (VRU) such as an electronic workforce 5 made by Edify Corporation of Santa Clara, California.

The Internet computer telephony system according to the present invention shown in Figure 1a additionally includes a bus 6 interconnected attached elements in a network, a computer 7 having a database, which may be a mainframe, a minicomputer, or a personal computer (PC). The system further includes a live agent system 8 including a live agent 8a, a personal computer (PC) 8b, and a second telephone 8c used by live agent 8a to communicate with switch 4. First telephone 3 is a conventional telephone employed by a user to initiate a user call. First telephone is connected to the central telephone network at a telephone switch 4. Telephone switch 4 is in turn connected to electronic workforce 5, and second telephone 8c. Further, electronic workforce 5, and second telephone 8c are each connected to bus 6 which in turn is connected to computer 7. Electronic workforce 5 is programmed according to the present invention to make an automated response to telephone calls received from switch 4, as discussed in detail below in connection with Figures 3a-3d. Particular details about electronic workforce 5 are provided in U.S. Patent Application Serial No. 07/708,463, filed May 5, 1991 and having the title "Object Oriented Customer Information Exchange System and Method" which is hereby expressly referenced and incorporated herein by reference.

The customer initially communicates with electronic workforce 5 through the Internet 6a via a personal computer 5a which has a browser 5a', and is able to communicate on line with a web page on electronic workforce 5.

Network bus 6 in Figure 1a is a parallel set of electric wires carrying byte wide data signals and control or information signals between network elements including call path server 5a, electronic workforce 5, personal computer 8b, and computer 7. The network bus can be a Telnet connection, for example. Computer 7 is a general purpose computer having memory for storing a data base as well as other well known computer features. Live agent 8a is a human person acting as a telephone operator or service individual. Switch 4 is connected to second telephone 8c through an automatic call distribution (ACD) queue. Personal computer 8a is a general purpose computer having a x86 architecture, for example. Personal computer 8a is connected through network bus 6 to computer 7 to receive customer information on a desk-top

pop-up screen offering a visual depiction of selected data stored in computer 7. Second telephone 8c is a consumer telephone device, for example, connected to switch 4 through an ACD queue.

Figure 1b is a block diagram of a live agent personal computer (PC) 8b including desktop control software 8b" which is loaded onto internal PC memory for operation. Further installed on PC 8b is a browser 8c which enables effective Internet communication, as will be discussed in greater detail immediately below.

Figure 1c is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing browser 5a' installed on a customer's personal computer, the Internet 6a, electronic workforce 5, computer 7, and a browser 8c installed on the personal computer of a live agent. This Figure is useful in comprehending Internet communications between a customer and a live agent, while parallel telephone communication is occurring. As changes in the database on computer 7 are taking place, these changes are being reflected on the web page being maintained on electronic workforce 5. Customer browser 5a' is updated by the customer making an information request to the web page on electronic workplace 5. Live agent browser 8c is separately updated by reference to electronic workplace 5, as will be discussed in detail below.

Figure 1d is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing browser 5a' installed on a customer's personal computer, the Internet 6a, electronic workforce 5, network bus 6, and computer 7. This Figure is useful in comprehending bilateral browser communications with electronic workforce 5, and bilateral communications between workforce 5 and computer 7. As changes in the database on computer 7 take place, these changes are reflected on the web page being maintained on electronic workforce 5. Customer browser 5a' is updated by the customer making an information request to the web page on electronic workplace 5. Browser 5a' asks for updates directly from electronic workforce 5, and browser 5a' receives the updates directly from electronic workforce 5 through the medium of the Internet 6a.

Figure 1e is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing electronic workforce 5 and browser 8c which is installed on the personal computer of a live agent. Electronic workforce 5 includes web page 5t. Live agent browser 8c includes cycling request block 8c', according to one embodiment of the present invention. This Figure is useful in comprehending how live agent browser 8c is updated, according to one embodiment of the present invention. As changes in the database on computer 7 are taking place, these changes are being reflected on web page 5t maintained on electronic workforce 5. Live agent browser 8c is updated by reference to electronic workplace 5 by a request automatically made, either cyclically, regularly,

or on a timed basis. The request is considered to be made by a particular software module referred to as the cycling request module 8c'. As a result of the cyclic request made (whether regular or irregular), electronic workforce 5 provides updated information from web page 5t or from a selected memory or storage location.

5 Such updating is described in greater detail in Figure 1f. In particular, live agent browser (LAB) asks 11 the electronic workforce to current web page information in mime form type. Next the live agent browser (LAB) asks the electronic workforce for current web page information in mime form. Next, the LAB receives 12 the information. Then, the LAB goes back 13 for more information. Thereafter, the LAB receives 14 more information. Finally,
10 operation continues at the beginning of block 13 with the LAB going back for more information. Once a request by LAB 8c is made in mime form, after every receipt of information, it automatically goes back for more information.

Figure 1g is a block diagram of selected portions of the combined Internet and computer telephone system according to the present invention, specifically showing electronic workforce
15 5, personal computer 8b, desktop control software 8b", and browser 8c which is installed on the personal computer of a live agent, according to one embodiment of the present invention. Electronic workforce 5 includes agent 5t' according to this embodiment. This Figure is useful in comprehending how live agent browser 8c is updated, according to one embodiment of the present invention. As changes in the database on computer 7 are taking place, these changes are
20 being reflected on web page 5t maintained on electronic workforce 5. Live agent browser 8c is updated by reference to electronic workplace 5 by a request made, upon direction from agent 5t. As a result of the directions provided by agent 5t (whether regular or irregular), browser 8c makes a request for an update to electronic workforce 5 and it receives the update from electronic workforce pursuant to its request for the update. Electronic workforce 5 provides the
25 updated information from web page 5t or from a selected memory or storage location. More particularly, agent 5t provides the directions to desktop control software 8b", which in turn provides direction to browser 8c to make a request of electronic workforce 5.

Such updating is described in greater detail in Figure 1h. In particular, electronic workforce agent 5t tells 16 desktop control software 8b" to simulate a user request for
30 information from electronic workforce 5. Then, desktop control software 8b" simulates 17 the request for information. Next, desktop control software 18 sends a simulated request to the live agent browser. Next, the live agent browser requests 19 an update. Finally, the live agent browser gets 20 an update.

Figures 2a-2b are a composite display window 20 for electronic workforce 5 indicating a
35 screen programming process according to which an automated call processing sequence is defined to respond automatically to a user telephone call. Display window 20 includes a menu

21 of action and device icons in respective first and second columns. As described in the above-referenced, incorporated patent application showing the electronic workforce 5, by selecting an action and device icon for placement at a grid position in display window 20, an object is established in a predetermined time sequence to cooperate with other linearly positioned objects, to perform automated call processing sequences. According to an embodiment of the present invention, Internet operation begins at grid position C1, followed by Internet login at C2. Synchronism is turned off at C3. Terminal login is checked at C4. Screen synchronism is accomplished at C5. Such synchronism means that the web page is updated. The Internet main menu is requested at C6. A choice of flow alternatives is indicated at C7. Six flow choices are indicated respectively at C8, D8, E8, F8, G8, and H8. The first flow choice beginning at C8 is an account flow. The first flow choice beginning at C8 is an account flow. The second flow choice beginning at D8 is an overdraft flow. The third flow choice beginning at E8 is a statement flow. The fourth flow choice beginning at F8 is a loan flow. The fifth flow choice beginning at G8 is a "call me" flow. The sixth flow choice beginning at H8 is an "other" flow. The account flow includes getting an account, as indicated at C9. The overdraft flow includes accomplishing screen synchronization, as indicated at D9. The statement flow includes accomplishing screen synchronization, as indicated at E9. The loan flow includes accomplishing screen synchronization, as indicated at F9. The "call me" flow includes waiting for an Internet screen, as indicated at G9. The "other" flow includes choosing another flow, as indicated at H9.

The account flow next includes accomplishing screen synchronization, as indicated at C10. The overdraft flow includes asking Internet, as indicated at D10. The statement flow includes asking Internet, as indicated at E10. The loan flow includes asking Internet, as indicated at F10. The "call me" flow includes calling the user or customer, as indicated at G10. The "other" flow includes operations being done or branching to further operations, as indicated respectively at H10 and I11.

Further operations are shown in Figure 2b. The account flow next includes asking Internet, as indicated at C11. The overdraft flow includes updating the database, as indicated at D11. The statement flow includes updating the database, as indicated at E11. The loan flow includes going to H9, as indicated at F11. The "call me" flow includes holding for the next customer service representative (CSR), as indicated at G11. The "other" flow includes ending synchronization or going to C5, as indicated respectively at H11 and I11.

The account flow next going to H9, as indicated at C12. The overdraft flow includes going to H9, as indicated at D12. The statement flow includes going to H9, as indicated at E12. The "call me" flow includes transferring to a customer service representative (CSR), as indicated at G12. The "other" flow includes stopping flow, as indicated at H12.

The "call me" flow includes asking for the customer service representative's identification (ID), as indicated at G13, then getting the network address for the particular customer service representative's personal computer as indicated at G14, turning synchronism on as indicated at G15, and going to C5 as indicated at H15 which would normally be next in linear flow at G16 but is for convenience depicted at H15.

Figure 3a shows operation of the Internet computer telephony system according to one embodiment of the present invention. In particular, when a customer makes a web call 30 over the Internet to electronic workforce 5, the electronic workforce answers the call electronically. Electronic workforce 5 electronically asks for the customer to provide identification information such an identification (ID) number and a telephone number. When the customer provides the ID# or the like, electronic workforce 5 gets 31 the customer ID#. Next, electronic workforce 5 uses the ID# to access database information on computer 7 about the customer, and gets 32 particular customer data which is of interest or utility with respect to the customer, from the database in computer 7. The particular customer data may for example indicate something about the relationship between the holder or operator of electronic workforce 5 and the customer, such as account or financial information, for example. As a consequence of having received the information, electronic workforce 5 accordingly sends 33 a web page response to the customer and provides selected information which has been acquired from computer 7. Electronic workforce 5 may play a menu of options or alternatives to the customer, after the information has been provided, including a choice as to whether the customer wishes to speak with a live person, i.e., live agent. This is possible, when the customer is surprised, for example, about the information received. For example, the customer may find there is a zero balance in an account.

The method according to the present invention continues at Figure 3b, with the customer looking at the received data and asking 34 for a live agent. Then, the customer selects a "call me" option 35 on a web page, by entering the customer's phone number.

Further, a supervised PBX transfer is invoked and the electronic workforce 5 calls a customer 36 and the customer answers. Next, electronic workforce 5 tells the customer to hold for a live agent. Then, electronic workforce 5 puts the customer on hold in the PBX and invokes supervised transfer to a live agent. After that, the live agent responds with a "hello" 37 and is asked 38 for identification by electronic workforce 5 operating through switch 4, which is provided either directly by the voice of the live agent, or by a DTMF signal either automatically provided or given by the human intervention of the particular live agent.

As shown in Figure 3d, electronic workforce 5 then looks up 39 the network address of the live agent at a memory location in electronic workforce 5, including a look-up table for

example which relates specific live agent ID#'s with the network addresses of the corresponding live agents. Next, the electronic workforce 5 connects to a live agent's desktop.

Then, as shown in Figure 3e, the electronic workforce brings the customer's web page up on the agent's desktop. At this time, customer and live agent are PBX connected 42.

What is claimed is:

1. A method for routing information from a data base first to an Internet caller to a live agent in response to Internet action, including the steps of:

- 5 receiving Internet message from an Internet caller,
identifying the Internet caller,
obtaining the Internet caller's telephone number,
obtaining data base information about the Internet caller, based upon Internet caller
identification information received,
determining whether live agent intervention is indicated,
10 selecting a live agent, and
routing the obtained data base information to the live agent.

2. The method according to claim 1, further comprising connecting the selected live agent with the Internet caller for voice communication.

15

3. The method according to claim 1, further comprising asking the live agent to provide identification.

20 4. The method according to claim 3, further comprising responding to a live agent identification request.

5. The method according to claim 4, further comprising providing live agent identification by voice.

25 6. The method according to claim 4, further comprising providing live agent identification electronically.

30 7. A method of connecting a customer a live agent in an automatic call distribution queue connected to a private branch exchange in turn connected to a voice response unit which is connected to a network having a computer holding a Internet caller information database, comprising:

receiving a message from an Internet caller,

electronically asking for Internet caller identification,
using the Internet caller identification information to retrieve customer data,
transmitting at least a portion of the retrieved Internet caller data to the Internet caller,
offering the customer a menu of response alternatives including the choice of speaking
5 with one of a number of live agents,
receiving a request for a live agent,
connecting with a live agent,
asking the live agent for identification,
using the identification to identify a computer associated with the live agent which has
10 been identified, and
providing the data associated with the customer to the live agent selected for live agent
communication.

8. The method according to claim 7, further comprising telling the live agent to answer a
15 call from a customer at a given signal.

9. The method according to claim 7, further comprising initiating voice communication
between a customer and a live agent.

20 10. A system for providing automated call response and live agent communication,
comprising:

a switch connected to a customer telephone,
a voice response unit connected to said switch and a network having a computer storing
customer information, said voice response unit adapted for communication with a customer to
25 produce a customer identification,
an Internet connection with a remote customer, and
a live agent desktop including a live agent telephone, and a live agent, and a live agent
personal computer, said live agent telephone connected to said switch, and said live agent
capable of ascertaining a live agent identification by engaging said switch to ask for live agent
30 identification.

11. A method of updating a browser in communication with a database associated with a computer, comprising:

- 5 sending the browser a message to request an update,
- receiving the message to request an update,
- requesting an update, and
- receiving the update.

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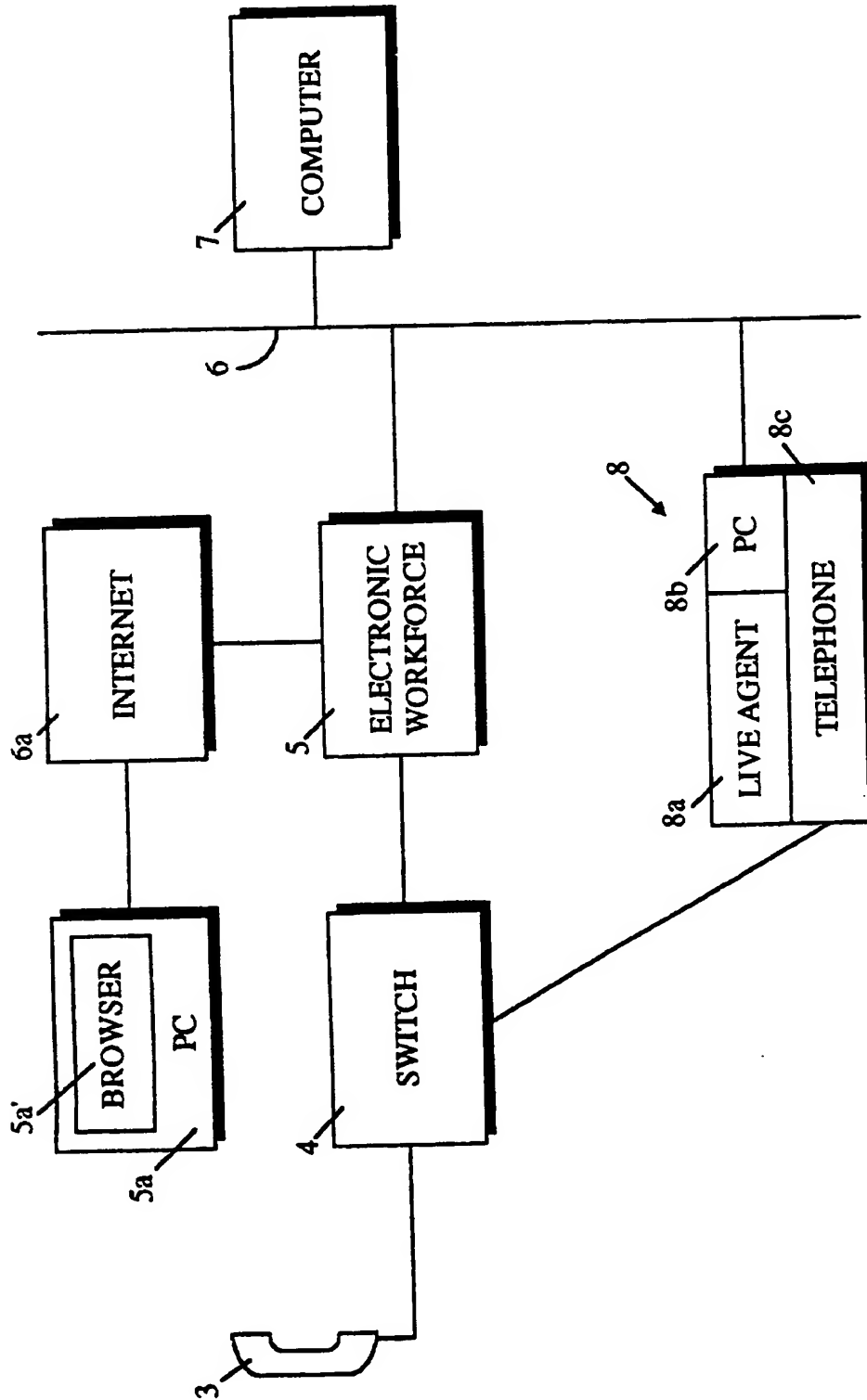


FIGURE 1a

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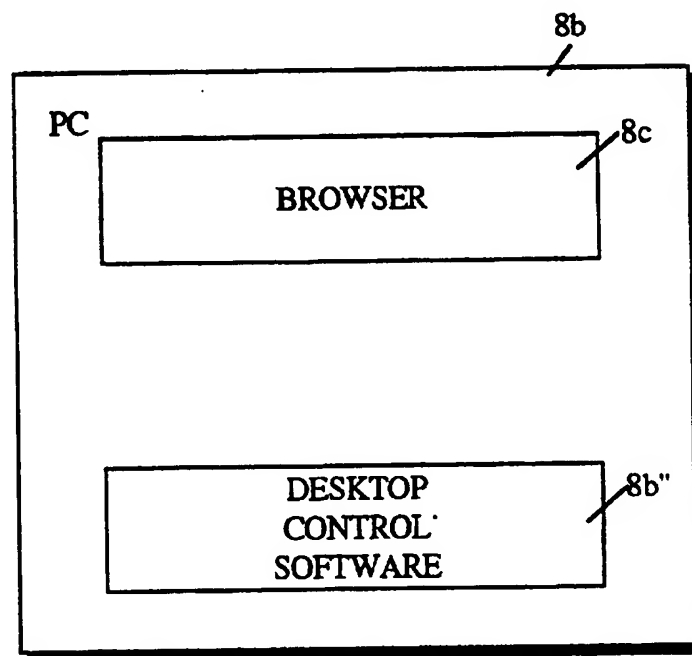


FIGURE 1b

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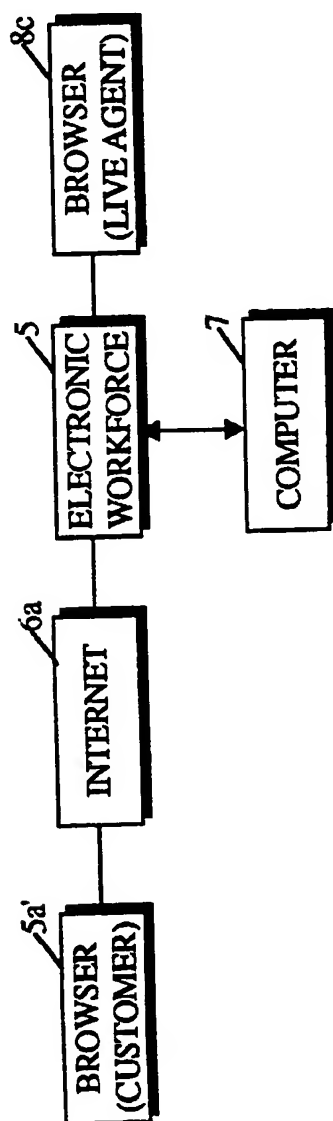


FIGURE 1c

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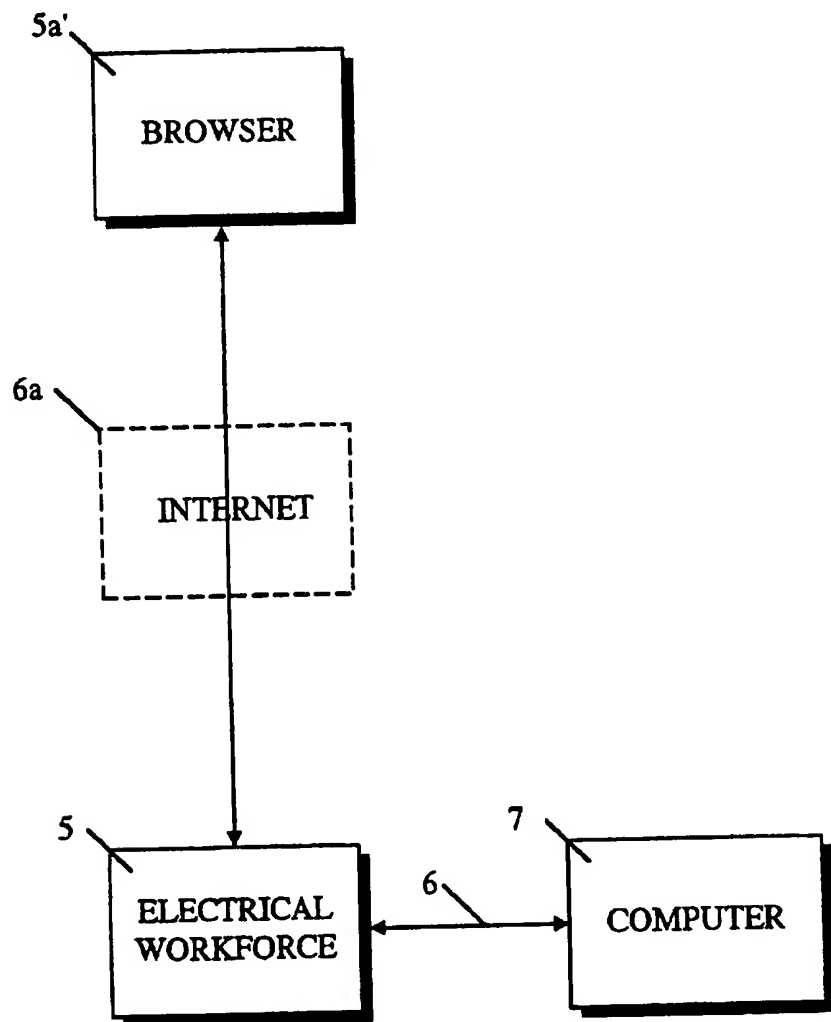


FIGURE 1d

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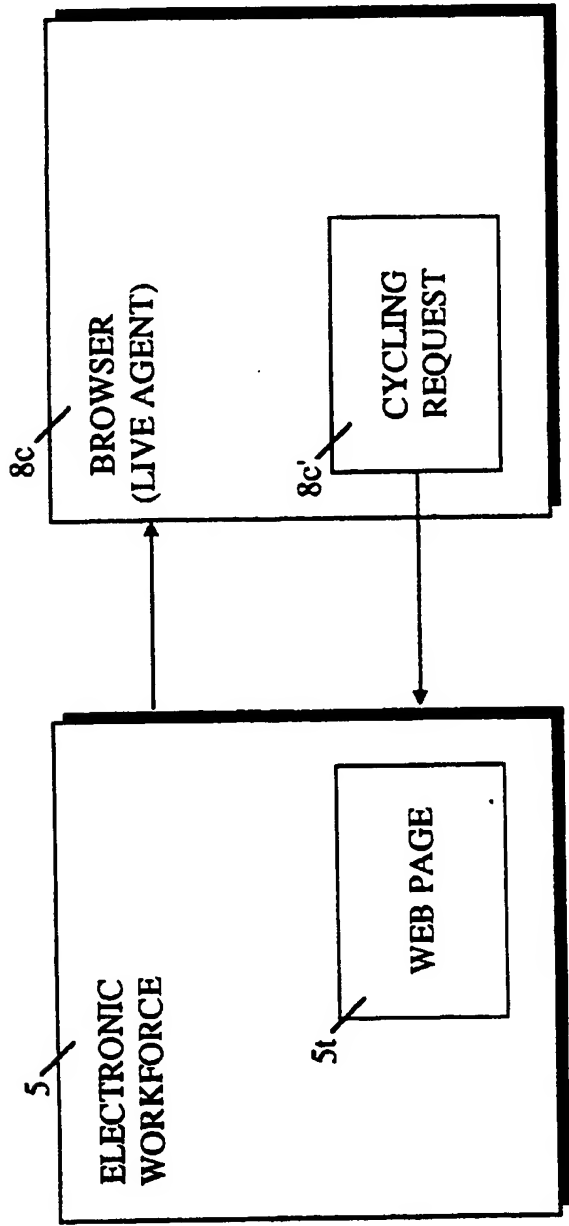


FIGURE 1e

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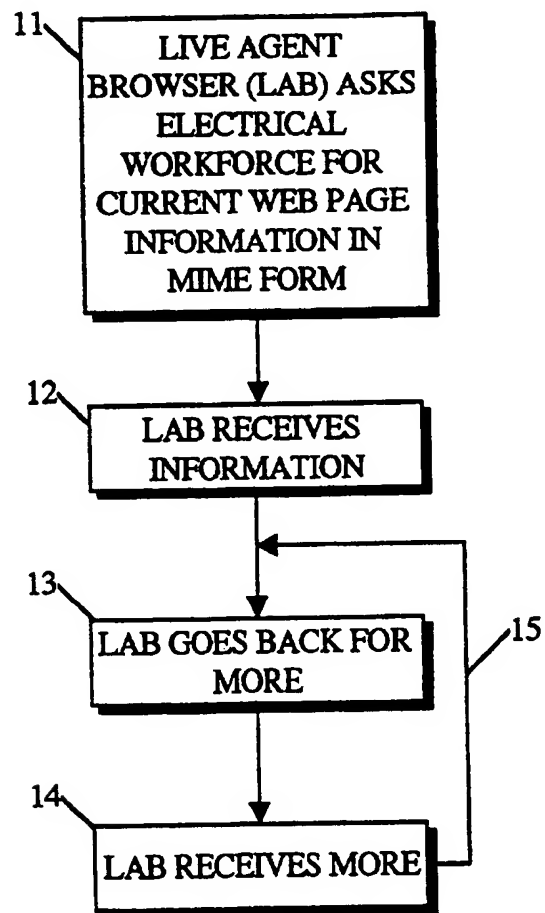


FIGURE 1f

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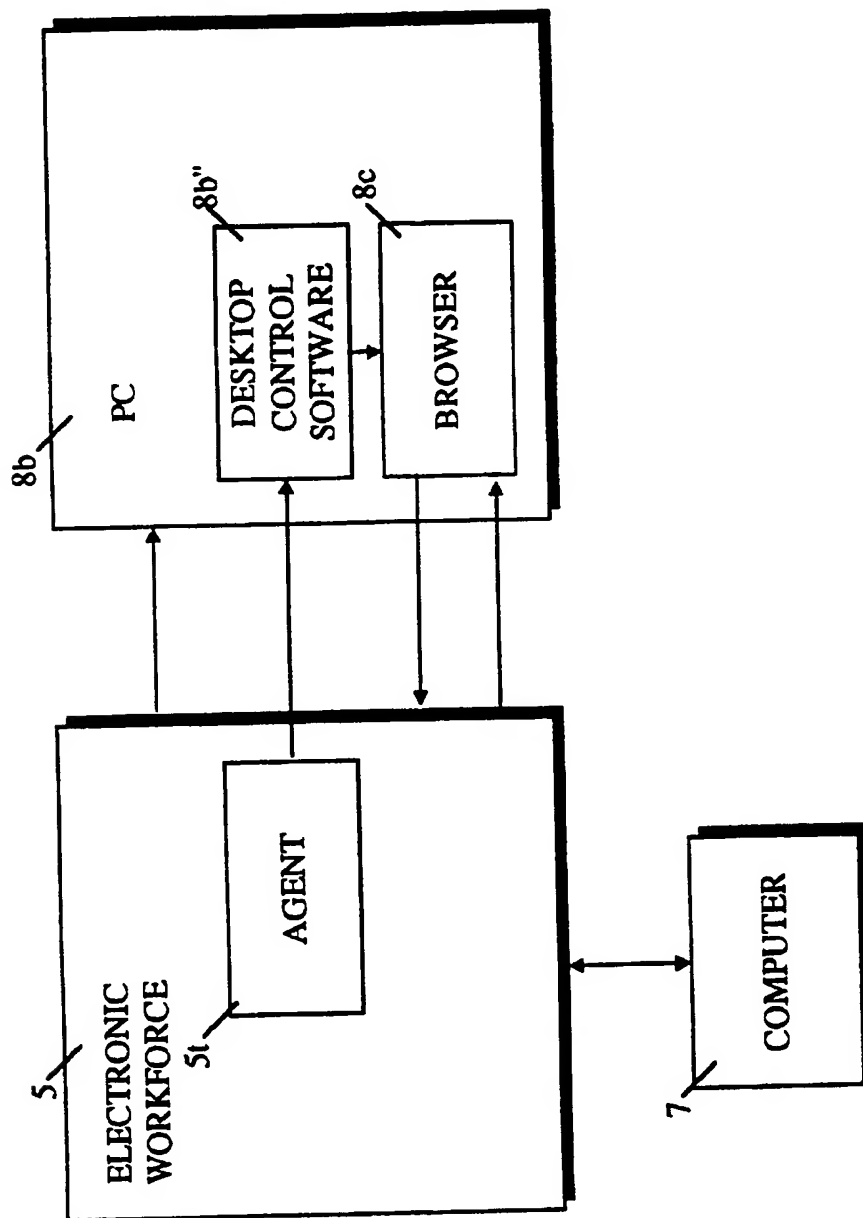


FIGURE 1g

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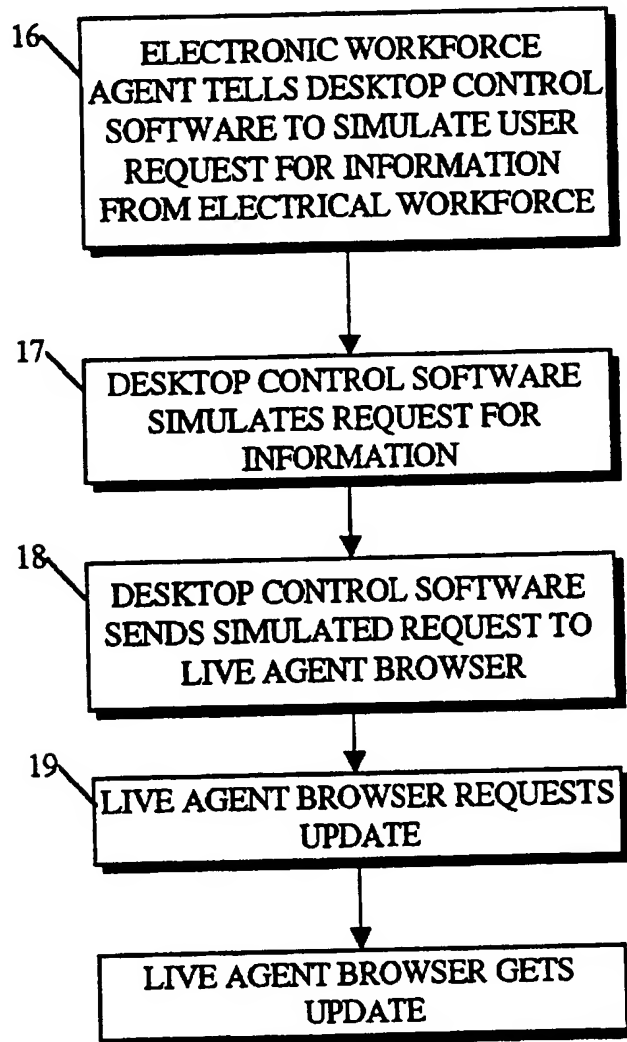
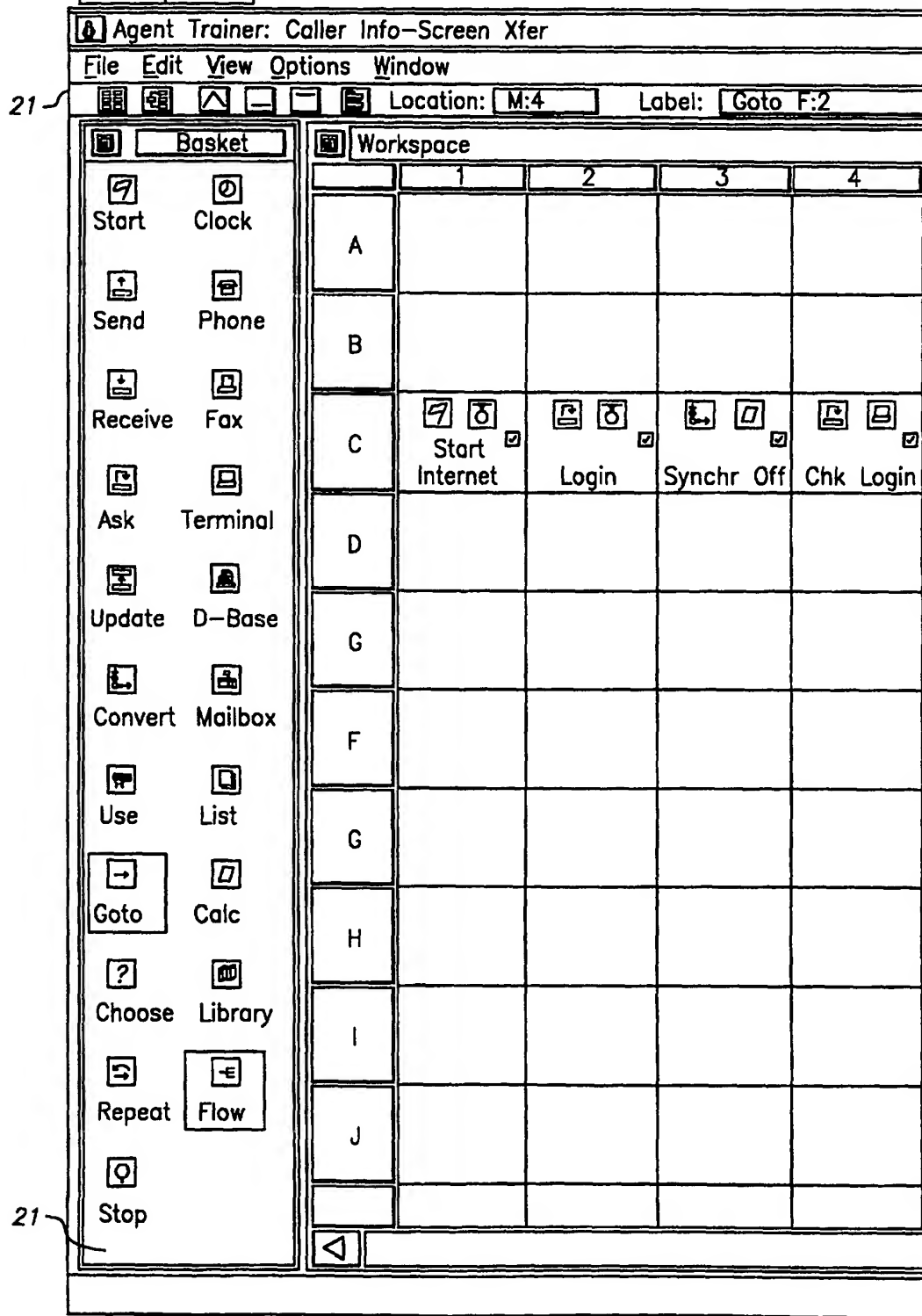


FIGURE 1h

FIG. 2a

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FIG. 2a-1
FIG. 2a-2**FIG. 2a-1**

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FIG. 2a-2

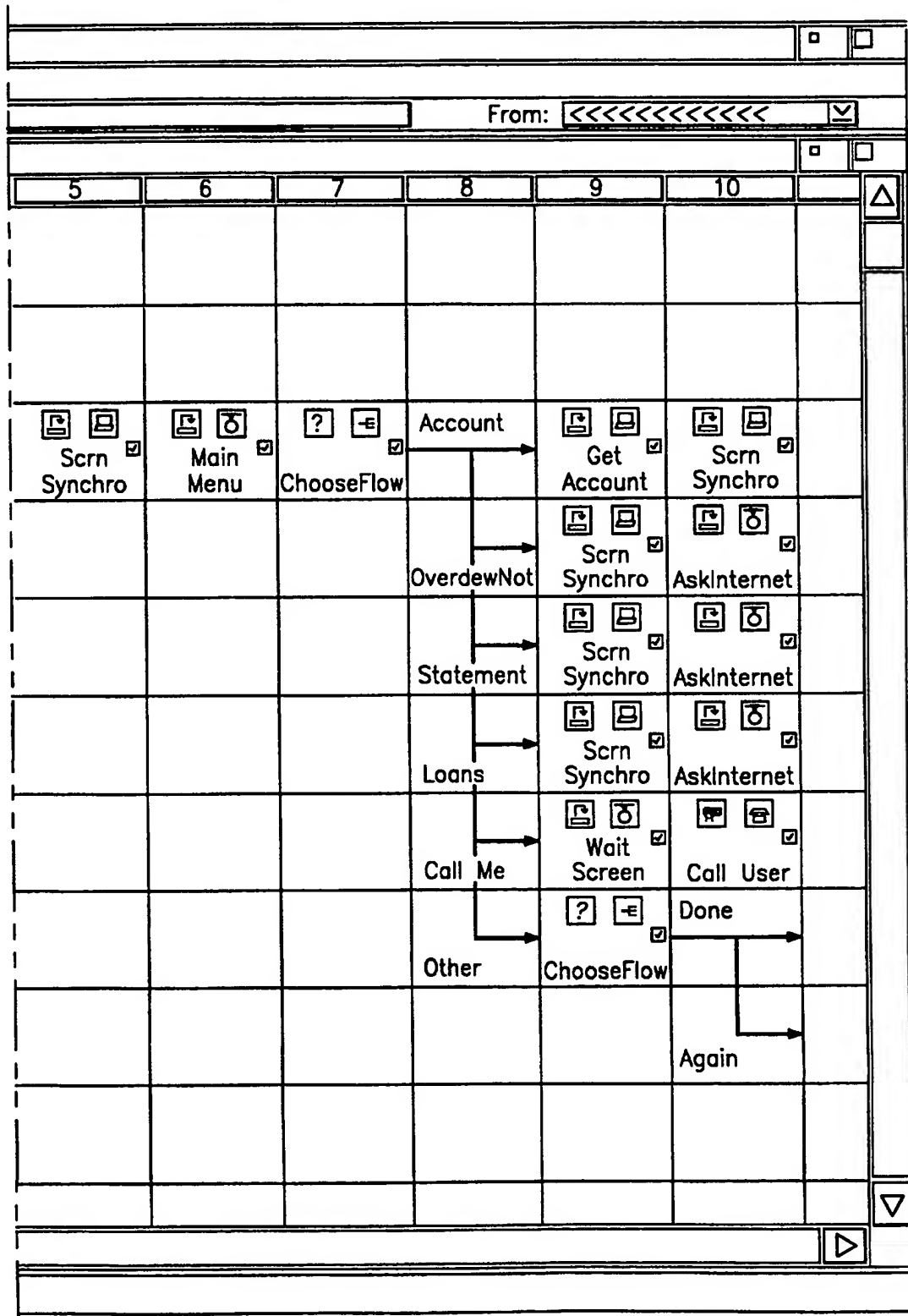
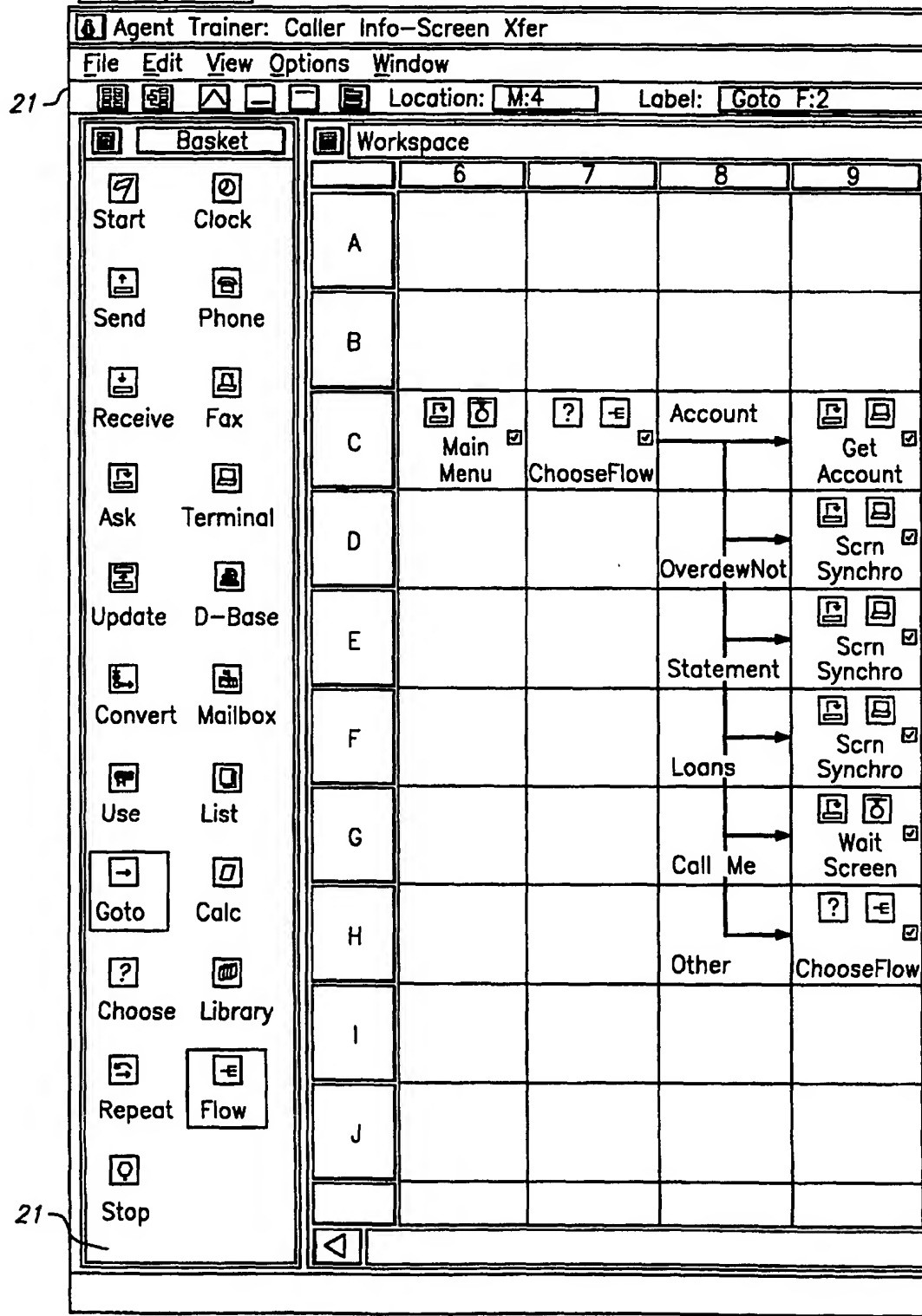


FIG. 2b

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FIG. 2b-1
FIG. 2b-2

FIG. 2b-1



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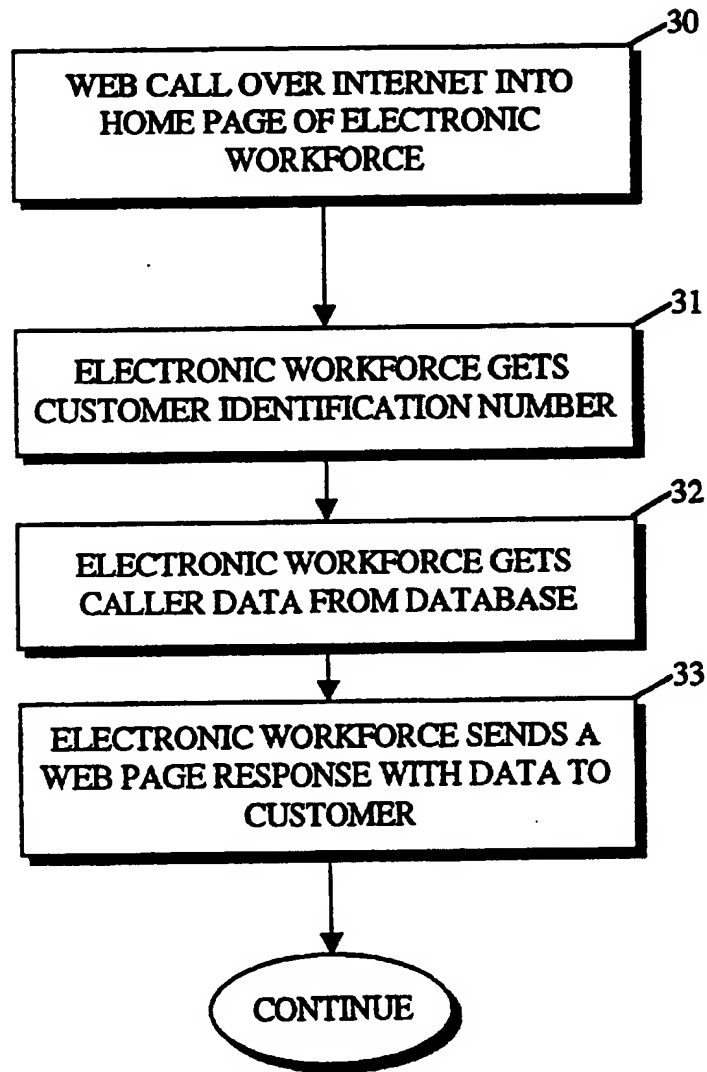


FIGURE 3a

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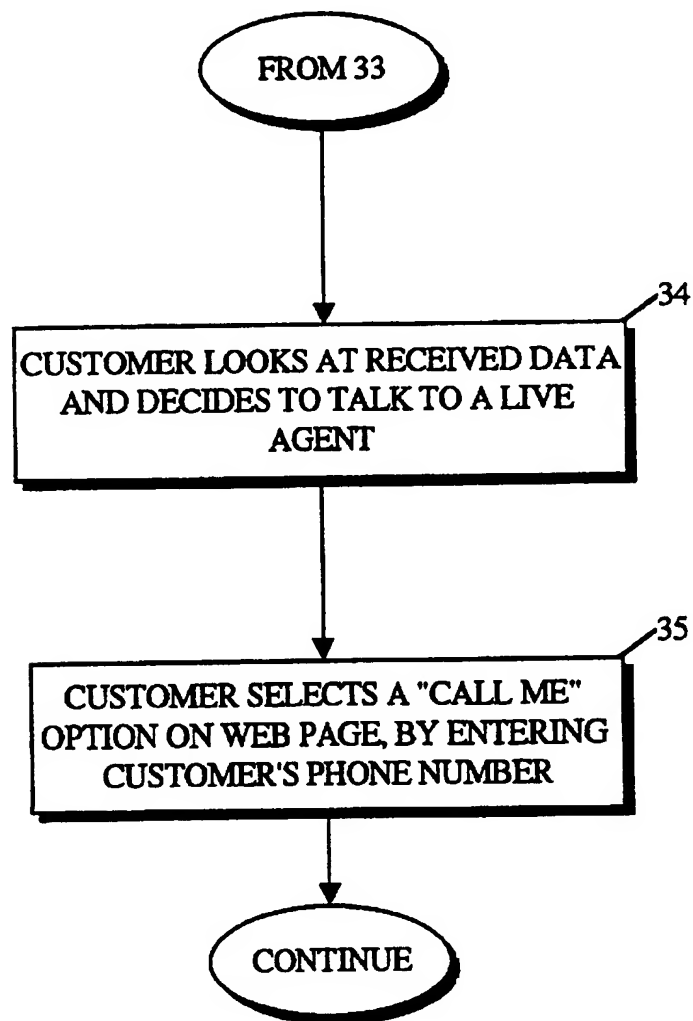


FIGURE 3b

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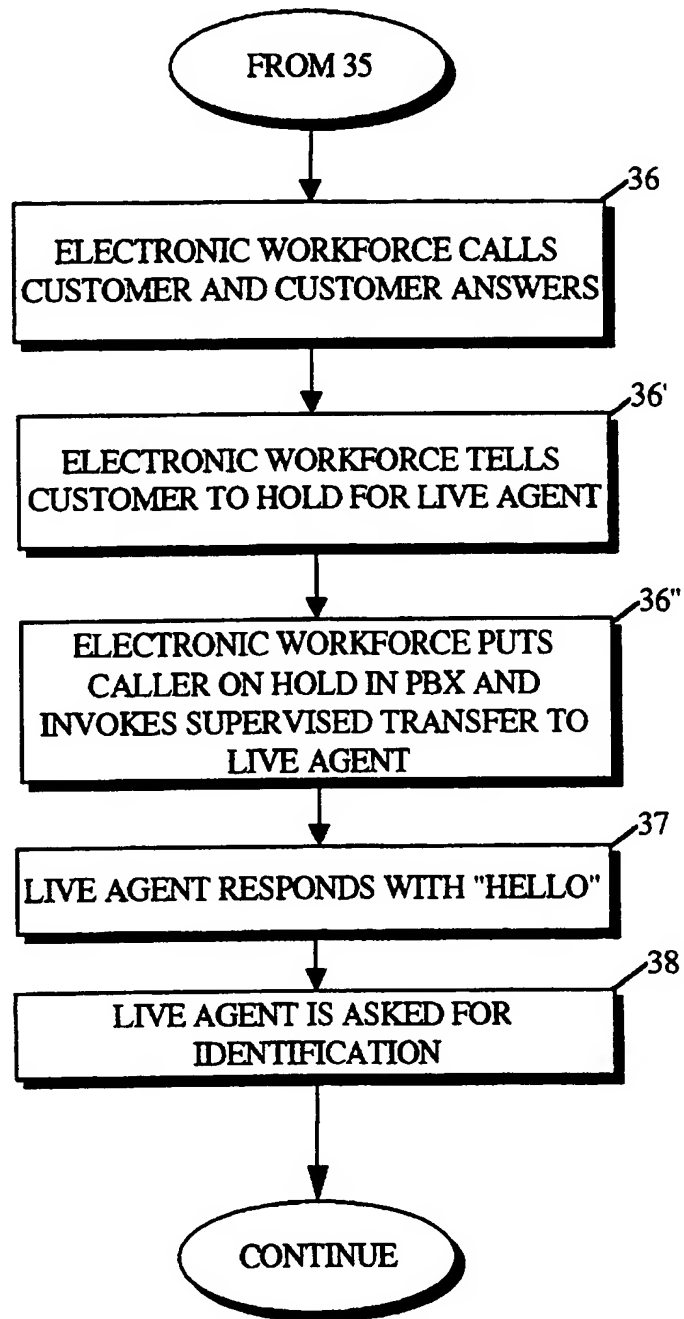


FIGURE 3c

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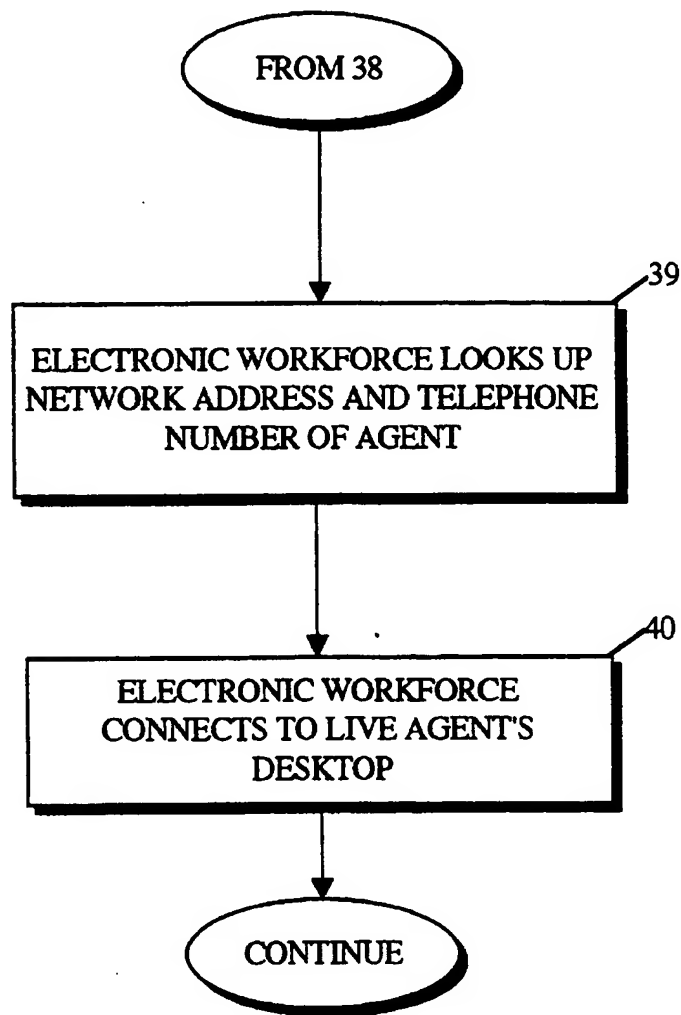


FIGURE 3d

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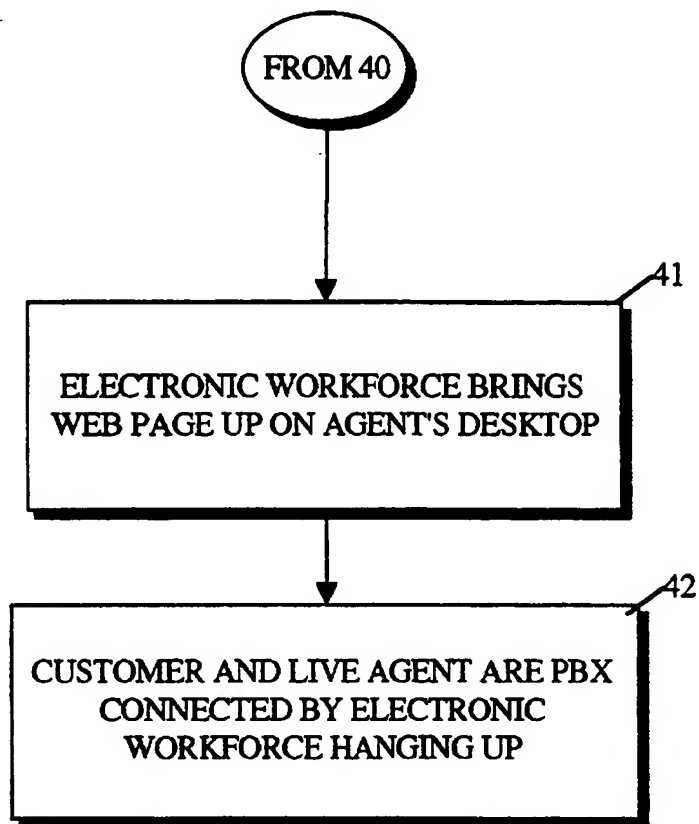


FIGURE 3e